

REMARKS

Election/Restrictions

Newly submitted claims 39-42 have been withdrawn from consideration as being directed to a non-elected invention. Applicant may file a divisional application to argue the patentability of these claims.

Status of Claims

1. Claims 1-8, 15, 17 and 19-27 were pending. Claims 39-42 stand withdrawn. Claims 1-5, 8 and 21 have been amended, and remain pending, and claims 6, 7, 15, 17, 19, 20 and 21-42 have been canceled.

Claim Objections

2. Claims 2-8, 15, 17 and 19-27 stand objected to because of the following informalities: the phrase "the invention" is said to be required to read "the hydrogen gas generating system" as claimed in independent claim 1. Claims 2-5, 8 and 21 have been amended as required and claims 6, 7, 15, 17, 19, 20 and 22-42 have been canceled. Claim 8 is said to be required to read "released gases" instead of "released cases" and has been amended as required.

Claim Rejections - 35 USC §103

4. Claims 1-8, 15, 17 and 19-20 stand rejected as obvious over Lillis et al. in view of Kinkelaar et al. Claims 1-5, 8 have been amended and claims 15, 17 and 19-20 have been canceled.

5. With regard to claim 1, Lillis et al. is said to disclose a hydrogen gas, generating system, a membrane electrode assembly including an anode, a cathode and an ionically conductive membrane, and electrical connections.

6. Applicant notes with appreciation that Lillis et al. has been held to not disclose a non-circulating fuel transport system using capillary action.

7. Kinkelaar et al. is said to teach wicking strands that transport water by capillary action for a fuel cell.

Kinkelaar et al. is said to further discloses a fuel transport system with a first and second portion in which a second portion can act as a barrier to gases being released through a vent.

The Examiner has held that it would have been obvious to one of ordinary skill in the art at the time of invention to modify Lillis et al.'s system with Kinkelaar et al.'s fuel transport system in order to controllably communicate liquid water and fuel to the anode. Claim 1 has been amended.

Applicant respectfully traverses this rejection because Kinkelaar et al., teaches the use of a capillary structure to transport the liquid and one or more holes through the capillary structure to transport gases without capillary action. See Kinkelaar et al. par. [0020]

" the capillarity structure may be formed so as to increase air permeability. Hence, if the capillarity structure is a sheet of capillarity material, the sheet may define one or more holes through its thickness, wherein the hole or holes are not capillarily active."

A modification of Lillis et al.'s system with Kinkelaar et al.'s fuel transport system would produce a system with wicking material for liquid transport by capillary action but with holes transporting gases without capillary action. The holes would not be barrier to the transport of liquid to the vent because the liquid would leak through the holes.

This modification would not therefore not render obvious the system including a non-circulating transport layer of wicking material for transferring a water/fuel mixture by capillary action from a first end portion of the layer wicking material from a source of the water/fuel mixture to said anode to generate hydrogen gas and for transferring gases released by consumption of the water/fuel mixture away from the anode by capillary action to a vent through a second end portion of the layer of wicking material, the second end portion of the layer acting as a barrier to the transport of the water/fuel mixture to the vent, as now claimed in claim 1 as amended.

8. With regard to claims 2-7, Kinkelaar et al. is said to teach the specific characteristics of the claimed fuel, transport system, including a first and second portion that are hydrophilic (fuel capillary action) and hydrophobic (capable of transporting gases) and connected to fuel/water sources and so connected between first and second portions, wherein hydrophilic portion has smaller pore size and higher capillary force. Kinkelaar et al. is also said to disclose interspersed portions and second portion acts a barrier to fuel/water mixture. Applicant respectfully traverses.

Claims 2-5 have been amended and claims 6-7 have been canceled. Nothing in Lillis et al or Kinkelaar et al single or combined renders obvious claims 2-5 which are dependent on independent claim 1.

With regard to claim 2, Kinkelaar et al. does not teach a second end portion of the layer of wicking material in contact with said first end portion of the layer of wicking material for collecting gases therefrom as now claimed in claim 2 as amended.

With regard to claim 3, Kinkelaar et al. does not teach areas of said first and second end portions of the layer of wicking material interspersed along the contact between the first and second end portions thereof as now claimed in claim 3 as amended.

With regard to claim 4, Kinkelaar et al. does not teach said areas of said first and second end portions of the layer of wicking material are interlaced as now claimed in claim 4 as amended.

With regard to claim 5, Applicant specifically traverses the Examiner's apparent holding that Kinkelaar et al.'s disclosure of holes and grooves capable of transporting gases is the equivalent of teaching that the second end portion of the layer of wicking material is hydrophobic, that is, not permeable to water. Holes and grooves by their nature are capable of being hydrophilic and permeable to water. The second end portion of the layer of wicking material is made to be hydrophobic so that it acts as a barrier to the water/fuel mixture.

Kinkelaar et al. therefore does not teach said second end portion of the layer of wicking material is hydrophobic, whereby the second end portion of the layer of wicking material acts as the barrier to the transport of the water/fuel mixture, being transported in said first end portion of the layer of wicking material, from being transported to the vent for the released gases as now claimed in claim 5 as amended.

9. With regard to claim 8, Lillis et al. is said to disclose the conventional components in the claims, including replaceable fuel water canister. Furthermore, Lillis et al. discloses a compartment capable of pressurizing a replaceable fuel/water mixture canister and capable of receiving released gases (i.e., atmosphere containing CO₂ released from process). Claim 8 has been amended.

In particular, Lillis et al does not teach a compartment receiving the released gases from the second end of the wicking layer, under pressure resulting from the release of the gases by consumption of the water/fuel mixture, for pressurizing the replaceable water/fuel mixture canister as now claimed in claim 8 as amended.

Nothing in Lillis et al or Kinkelaar et al taken singly or combined renders obvious claim 8 which is dependent on independent claim 1.

10. With regard to claims 15, 17, 19-20, Lillis et al. is said to disclose the conventional components in the claims. In order to expedite the allowance of this case, Applicant has canceled

claims 15, 17, 19-20 but may file a divisional or other application to further argue the patentability of these claims.

11. Claims 21-27 stand rejected as obvious over Lillis et al. in view of Kinkelaar et al. and further in view of Pien et al. Claim 21 has been amended. In order to expedite the allowance of this case, Applicant has canceled claims 22-27 but may file a divisional or other application to further argue the patentability of these claims.

Nothing in Lillis et al or Kinkelaar et al taken singly or combined renders obvious a cooling system and a layer of hydrophilic wicking material for returning the condensed water/fuel mixture to the cathode as claimed in claim 21 as now amended, which is dependent on independent claim 1.

Applicants respectfully request that the Examiner reconsider the rejections of the claims in light of the amendments and arguments presented herein, enter this amendment and allow the pending claims to pass to issue.

Respectfully Submitted,

Date: September 7, 2007

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